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Cystic Fibrosis Research News

Title:

NON-FASTING BIOELECTRICAL IMPEDANCE ANALYSIS IN CYSTIC FIBROSIS: IMPLICATIONS FOR CLINICAL PRACTICE AND RESEARCH

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What was your research question?

Body composition can be divided into fat mass and fat-free mass containing bones, organs, muscles and water. Body composition affects pulmonary function in people with cystic fibrosis (CF) and can be monitored by using bioelectrical impedance analysis (BIA). This BIA is a commonly used method for estimating body composition in clinical practice.
Individuals are not allowed to eat before BIA measurements, which is difficult. We asked if it is necessary for individuals to not eat or drink before performing BIA measurements.

Why is this important?

Nutritional status is often determined by using body mass index (BMI). However, BMI does not distinguish between the amount of fat free mass (FFM) and fat mass (FM). This is important because people with CF with a higher FFM (in kg) have a better pulmonary function than those with a higher FM (in kg and %). Therefore, the need for a more detailed assessment of body composition is warranted, because people with CF may have a normal BMI, but can still have an unfavorable proportion of FFM and FM. BIA measures the resistance of the body against a small electrical current and can indicate body composition.

Cystic Fibrosis Research News

What did you do?

All study participants underwent whole body single frequency BIA measurements at the outpatient clinic, before and after their nutritional and fluid intake in the morning. We assessed whether nutritional and fluid intake affects the FM and FFM quantity determined by BIA measurements, and if any effect present was clinically relevant. For clinical applicability, we additionally investigated whether associations between BIA results with pulmonary function are different when using fasting or non-fasting data. Pulmonary function was assessed by spirometry tests and expressed as FEV1%predicted.

What did you find?

Nutritional and fluid intake significantly increased FFM estimates by 0.23 kg, and significantly lowered FM estimates by 0.22 kg, but these changes are not clinically relevant. Furthermore, in 86% of the participants, the difference in FFM and FM estimates after nutritional and fluid intake was less than 1 kg. After adjusting FFM and FM for height, the estimates remained similar in 83% of these individuals. These results show that classification of individuals with CF is similar before and after nutritional and fluid intake. The associations between BIA results with pulmonary function remained similar before and after nutritional and fluid intake.

What does this mean and reasons for caution?

Differences between fasting and non-fasting FFM and FM were not clinically relevant, and associations with pulmonary function remained similar. Therefore, assessment and monitoring of nutritional status by using BIA measurements can be performed after nutritional and fluid intake by adults with CF visiting the outpatient clinic. These results also indicate that non-fasting BIA measurements can be registered in electronic patient records and that researchers may use these data for research purposes. However, the study results should cautiously be interpreted when applied to other body composition devices. Reproducibility increases when measurements over time are performed using similar testing conditions.

What's next?

We continue performing BIA measurements after nutritional and fluid intake by our adults with CF visiting the outpatient clinic. Follow up data can be used to monitor nutritional status of each individual in order to optimize pulmonary function.

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